

**IN THE CLAIMS:**

- 1 1. (Original) A storage medium containing program instructions readable by a com-  
2 puter for detecting and resolving circular flow paths disposed within a flow diagram rep-  
3 resenting the logical operation of a corresponding application program, the flow diagram  
4 formed by interconnecting a plurality of symbolic representations of program objects, the  
5 program objects configured to execute associated functions in response to corresponding  
6 triggering events, the readable program instructions comprising program instructions for:  
7       establishing a busy indicator at a given program object, the busy indicator signi-  
8 fying whether the given program object is currently executing its associated function;  
9       in response to the occurrence of the given program object's triggering event,  
10 testing the respective busy indicator;  
11       if the busy indicator signifies that the given program object is currently executing,  
12 blocking the given program object from re-executing in response to the triggering event;  
13       if the busy indicator signifies that the given program object is not currently exe-  
14 cuting, permitting the given program object to execute in response to the triggering event.
- 1 2. (Original) The storage medium of claim 1 wherein the busy indicator is a counter and  
2 the program instructions for testing comprise program instructions for:  
3       adjusting the counter; and  
4       after the program instructions for adjusting, determining whether the counter ex-  
5 ceeds a predetermined threshold,  
6 wherein an exceedance of the predetermined threshold signifies that the given program  
7 object is currently executing.
- 1 3. (Original) The storage medium of claim 2 further comprising program instructions  
2 for initializing the counter to a null value, and wherein the program instructions for ad-  
3 justing comprise program instructions for incrementing the counter.

1 4. (Original) The storage medium of claim 3 further comprising program instructions  
2 for, after the program instructions for determining whether the counter exceeds a prede-  
3 termined threshold, decrementing the counter.

1 5. (Original) The storage medium of claim 4 wherein the program instructions for in-  
2 crementing the counter increment the counter by 1, the program instructions for decre-  
3 menting the counter decrement the counter by 1, and the predetermined threshold is 1.

1 6. (Original) The storage medium of claim 4 wherein the given program object in-  
2 cludes one or more output properties having corresponding values that may be changed in  
3 response to execution of the given program object's associated function and, during exe-  
4 cution, the given program object is configured to issue at least one ready event upon  
5 changing the values of its one or more output properties and one or more program objects  
6 may register for notification of the at least one ready event, further wherein the program  
7 instructions for decrementing the counter occur after all of the registered objects have  
8 been notified of the given object's at least one ready event.

1 7. (Original) A program object configured to execute an associated function in response  
2 to a triggering event, the program object used in developing an application program  
3 whose logical operation is represented by a corresponding flow diagram, the program  
4 object having program instructions for detecting and resolving circular flow paths dis-  
5 posed within the flow diagram, the program instructions comprising program instructions  
6 for:

7       establishing a busy indicator at the program object, the busy indicator signifying  
8 whether the program object is currently executing its associated function;

9       in response to an occurrence of the program object's triggering event, testing the  
10 busy indicator;

11       if the busy indicator signifies that the program object is currently executing,  
12 blocking the program object from re-executing in response to the triggering event;

13           if the busy indicator signifies that the program object is not currently executing,  
14     permitting the program object to execute in response to the triggering event.

1     8. (Original) The program object of claim 7 wherein the busy indicator is a counter and  
2     the program instructions for testing comprise program instructions for:  
3         adjusting the counter; and  
4         after the program instructions for adjusting, determining whether the counter ex-  
5     ceeds a predetermined threshold,  
6     wherein an exceedance of the predetermined threshold signifies that the program object is  
7     currently executing.

1     9. (Original) The program object of claim 8 further comprising program instructions for  
2     initializing the counter to a null value, and wherein the program instructions for adjusting  
3     comprise program instructions for incrementing the counter.

1     10. (Original) The program object of claim 9 further comprising program instructions  
2     for, after the program instructions for determining whether the counter exceeds a prede-  
3     termined threshold, decrementing the counter.

1     11. (Original) The program object of claim 10 wherein the program instructions for in-  
2     crementing the counter increment the counter by 1, the program instructions for decre-  
3     menting the counter decrement the counter by 1, and the predetermined threshold is 1.

1     12. (Original) The program object of claim 10 wherein the program object includes one  
2     or more output properties having corresponding values that may be changed in response  
3     to execution of its associated function and, during execution, the program object is con-  
4     figured to issue at least one ready event upon changing the values of its one or more out-  
5     put properties and one or more other program objects within the application program may  
6     register for notification of the at least one ready event, further wherein the program in-

7 instructions for decrementing the counter occur after all of the registered objects have been  
8 notified of the given object's at least one ready event.

1 13. (Previously presented) A method for preventing circular flow paths in a graphical  
2 programming system having a plurality of program objects, the method comprising:  
3 establishing a busy indicator at a given program object, the busy indicator signi-  
4 fying whether the given program object is currently executing an associated function;  
5 in response to an occurrence of a triggering event which causes the given program  
6 object's associated function to execute, testing the busy indicator;  
7 if the busy indicator signifies that the given program object is currently executing,  
8 blocking the given program object from re-executing in response to the triggering event;  
9 if the busy indicator signifies that the given program object is not currently exe-  
10 cuting, permitting the given program object to execute in response to the triggering event;  
11 and  
12 notifying other objects in the plurality of program objects when one or more out-  
13 put values associated with the given program object is changed during execution of the  
14 given program object's associated function.

1 14. (Previously presented) An apparatus that prevents circular flow paths in a graphical  
2 programming system having a plurality of program objects, the apparatus comprising:  
3 means for establishing a busy indicator at a given program object, the busy indi-  
4 cator signifying whether the given program object is currently executing an associated  
5 function;  
6 means for testing the busy indicator in response to an occurrence of a triggering  
7 event which causes the given program object's associated function to execute;  
8 means for blocking the given program object from re-executing in response to the  
9 triggering event if the busy indicator signifies that the given program object is currently  
10 executing;

11 means for permitting the given program object to execute in response to the trig-  
12 gering event if the busy indicator signifies that the given program object is not currently  
13 executing; and

14 means for notifying other objects in the plurality of program objects when one or  
15 more output values associated with the given program object is changed during execution  
16 of the given program object's associated function.

1 15. (Previously presented) A method for preventing circular flow paths in a graphical  
2 programming system having a plurality of program objects, the method comprising:

3 establishing a busy indicator at a given program object, the busy indicator signi-  
4 fying whether the given program object is currently executing an associated function;

5 in response to an occurrence of a triggering event which causes the given program  
6 object's associated function to execute, testing the busy indicator;

7 if the busy indicator signifies that the given program object is currently executing,  
8 blocking the given program object from re-executing in response to the triggering event;  
9 and

10 if the busy indicator signifies that the given program object is not currently exe-  
11 cuting, permitting the given program object to execute in response to the triggering event.

1 16. (Previously presented) The method of claim 15, further comprising:

2 establishing the busy indicator as an adjustable counter; and

3 determining whether the given program object is currently executing based on  
4 whether a value of the counter exceeds a predetermined threshold.

1 17. (Previously presented) The method of claim 16 further comprising:

2 initializing the value of the counter to a null value.

1 18. (Previously presented) The method of claim 16 further comprising:

2 incrementing the value of the counter when testing the busy indicator; and

3           decrementing the value of the counter after determining whether the value of the  
4   counter exceeds a predetermined threshold.

1   19. (Previously presented) The method of claim 18 further comprising:  
2           setting the predetermined threshold equal to one;  
3           incrementing the value of the counter by one when the value of the counter is in-  
4   cremented;  
5           decrementing the value of the counter by one when the value of the counter is  
6   decremented.

1   20. (Previously presented) The method of claim 15, further comprising:  
2           issuing at least one ready event in response to one or more output values associ-  
3   ated with the given object being changed during execution of the given program object's  
4   associated function; and  
5           notifying one or more program objects that the at least one ready event has been  
6   issued.

1   21. (Previously presented) An apparatus for preventing circular flow paths in a graphi-  
2   cal programming system having a plurality of program objects, the apparatus comprising:  
3           means for establishing a busy indicator at a given program object, the busy indi-  
4   cator signifying whether the given program object is currently executing an associated  
5   function;  
6           means for testing the busy indicator in response to an occurrence of a triggering  
7   event which causes the given program object's associated function to execute;  
8           means for blocking the given program object from re-executing in response to the  
9   triggering event if the busy indicator signifies that the given program object is currently  
10   executing; and  
11           means for permitting the given program object to execute in response to the trig-  
12   gering event if the busy indicator signifies that the given program object is not currently  
13   executing.

1 22. (Previously presented) A computer-readable media, comprising:  
2 instructions for execution in a processor for the practice of a method for prevent-  
3 ing circular flow paths in a graphical programming system having a plurality of program  
4 objects, said method having the steps,  
5 establishing a busy indicator at a given program object, the busy indicator  
6 signifying whether the given program object is currently executing an associated  
7 function;  
8 in response to an occurrence of a triggering event which causes the given  
9 program object's associated function to execute, testing the busy indicator;  
10 if the busy indicator signifies that the given program object is currently  
11 executing, blocking the given program object from re-executing in response to the  
12 triggering event; and  
13 if the busy indicator signifies that the given program object is not currently  
14 executing, permitting the given program object to execute in response to the trig-  
15 gering event.

1 23. (Previously presented) Electromagnetic signals comprising instructions for execu-  
2 tion on a processor for the practice of a method for preventing circular flow paths in a  
3 graphical programming system having a plurality of program objects, said method having  
4 the steps,  
5 establishing a busy indicator at a given program object, the busy indicator  
6 signifying whether the given program object is currently executing an associated  
7 function;  
8 in response to an occurrence of a triggering event which causes the given  
9 program object's associated function to execute, testing the busy indicator;  
10 if the busy indicator signifies that the given program object is currently  
11 executing, blocking the given program object from re-executing in response to the  
12 triggering event; and

13                   if the busy indicator signifies that the given program object is not currently  
14           executing, permitting the given program object to execute in response to the trig-  
15           gering event.